WHAT IS CLAIMED IS:

1. An isolated antibody or fragment thereof comprising:

(a) an amino acid sequence that is at least 80% identical to a VH domain of any one of the scFvs of SEQ ID NOS:48-56;

(b) an amino acid sequence that is at least 80% identical to a VL domain of any one of the scFvs of SEQ ID NOS:48-56; or

(c) both (a) and (b);

wherein said antibody or fragment thereof specifically binds protective antigen (PA).

2. The antibody or fragment thereof of claim 1 that comprises (a).

3. The antibody or fragment thereof of claim 1 that comprises (b).

4. The antibody or fragment thereof of claim 1 that comprises (c).

5. The antibody or fragment thereof of claim 1, wherein said antibody or fragment thereof inhibits binding of PA to anthrax receptor (ATR).

6. The antibody or fragment thereof of claim 1, wherein said antibody or fragment thereof inhibits an activity selected from the group consisting of:

(a) binding of PA to capillary morphogeneis protein 2 (CMG2);

(b) protease cleavage of PA into PA20 and PA63;

(c) heptamerization of PA63;

(d) PA63 binding to edema factor (EF);

(e) PA63 binding to lethal factor (LF);

(f) PA-mediated translocation of EF across a cell membrane; and

(g) PA-mediated translocation of LF across a cell membrane.

7. The antibody or fragment thereof of claim 1 wherein said PA is purified from a bacterial cell culture, and wherein said PA is encoded by a polynucleotide encoding amino acids 1 to 764 of SEQ ID NO:2 operably associated with a regulatory sequence that controls expression of said polynucleotide.

8. The antibody or fragment thereof of claim 1 wherein the antibody or fragment thereof is a monoclonal antibody.

9. The antibody or fragment thereof of claim 1 wherein the antibody or fragment thereof is a human antibody.

10. The antibody or fragment thereof of claim 1 wherein the antibody or fragment thereof is selected from the group consisting of:

(a) a whole immunoglobulin molecule;

(b) an scFv;

(c) a chimeric antibody;

(d) a Fab fragment;

(e) an F(ab')2; and

(f) a disulfide linked Fv.

11. The antibody or fragment thereof of claim 1 which comprises a heavy chain immunoglobulin constant domain selected from the group consisting of:

(a) a human IgM constant domain;

(b) a human IgG1 constant domain;

(c) a human IgG2 constant domain;

(d) a human IgG3 constant domain;

(e) a human IgG4 constant domain; and

(f) a human IgA constant domain.

12. The antibody or fragment thereof of claim 1 which comprises a light chain immunoglobulin constant domain selected from the group consisting of:

(a) a human Ig kappa constant domain; and

(b) a human Ig lambda constant domain.

13. The antibody or fragment thereof of claim 1 wherein the antibody or fragment thereof has a dissociation constant (K_D) of less than or equal to 10^{-9} M.

14. The antibody or fragment thereof of claim 1 wherein the antibody or fragment thereof has a K_D less than or equal to 10^{-10} M.

15. The antibody or fragment thereof of claim 1 wherein the antibody or fragment thereof has a K_D between less than or equal to 10^{-11} M.

16. The antibody or fragment thereof of claim 1 wherein the antibody or fragment thereof has a K_D between less than or equal to 10^{-12} M.

17. The antibody or fragment thereof of claim 1 wherein the antibody or fragment thereof is conjugated to a detectable label.

18. The antibody or fragment thereof of any one of claim 1 wherein the antibody or fragment thereof is attached to a solid support.

19. The antibody or fragment thereof of claim 1 wherein the antibody or fragment thereof specifically binds PA in a Western blot.

20. The antibody or fragment thereof of claim 1 wherein the antibody or fragment thereof specifically binds PA in an ELISA.

21. An isolated cell that produces the antibody or fragment thereof of claim 1.

22. A method of treatment of anthrax infection or anthrax toxin poisoning comprising administering to an animal the antibody or fragment thereof of claim 1.

23. The method of claim 22 wherein the animal is a human.

24. The method of claim 22 wherein the treatment is prophylactic.

25. The method of claim 22 wherein the antibody or fragment thereof is administered in combination with a second antibody or fragment thereof that specifically binds PA.

26. The method of claim 22 wherein the antibody or fragment thereof is administered in combination with an anti-anthrax agent.

27. The method of claim 26 wherein the anti-anthrax agent is selected from the group consisting of:

(a) a soluble form of the ATR receptor;

(b) a soluble form of the CMG2 receptor;

(c) an anti-ATR antibody;

(d) an anti-EF antibody;

(e) an anti-LF antibody;

(f) an anthrax vaccine; and

(g) a polyvalent form of the P1 peptide.

28. The method of claim 22 wherein the antibody or fragment thereof is administered in combination with an antibiotic.

29. The method of claim 28 wherein the antibiotic is ciprofloxacin hydrochloride.

30. The method of claim 28 wherein the antibiotic is doxycycline.

31. The method of claim 28 wherein the antibiotic is selected from the group consisting of:

(a) penicillin G procaine;

(b) amoxicillan;

(c) ofloxacin; and

(d) levofloxacin.

32. The method of claim 22 wherein the antibody or fragment thereof is administered in combination with a member selected from the group consisting of:

(a) a protease inhibitor;

(b) an anti-TNF-alpha antibody; and

(c) an anti-IL-1beta antibody.

33. A kit comprising the antibody or fragment thereof of claim 1 and a means for administering said antibody to an animal.

34. The kit of claim 33 wherein the animal is a human.

35. An isolated antibody or fragment thereof comprising:

(a) the amino acid sequence of aVH domain of any one of the scFvs of SEQ ID NOS:48-56;

(b) the amino acid sequence of the VL domain of any one of the scFvs of SEQ ID NOS:48-56; or

(c) both (a) and (b);

wherein said antibody or fragment thereof specifically binds PA.

36. The antibody or fragment thereof of claim 35 that comprises (a).

37. The antibody or fragment thereof of claim 35 that comprises (b).

38. The antibody or fragment thereof of claim 35 that comprises (c).

39. The antibody or fragment thereof of claim 35, wherein said antibody or fragment thereof inhibits binding of PA to ATR.

40. The antibody or fragment thereof of claim 35, wherein said antibody or fragment thereof inhibits an activity selected from the group consisting of:

(a) binding of PA to capillary morphogeneis protein 2 (CMG2);

(b) protease cleavage of PA into PA20 and PA63;

(c) heptamerization of PA63;

(d) PA63 binding to edema factor (EF);

(e) PA63 binding to lethal factor (LF);

(f) PA-mediated translocation of EF across a cell membrane; and

(g) PA-mediated translocation of LF across a cell membrane.

41. The antibody or fragment thereof of claim 35 wherein said PA is purified from a bacterial cell culture, and wherein said PA is encoded by a polynucleotide encoding amino acids 1 to 764 of SEQ ID NO:2 operably associated with a regulatory sequence that controls expression of said polynucleotide.

42. The antibody or fragment thereof of claim 35 wherein the antibody or fragment thereof is a monoclonal antibody.

43. The antibody or fragment thereof of claim 35 wherein the antibody or fragment thereof is a human antibody.

44. The antibody or fragment thereof of claim 35 wherein the antibody or fragment thereof is selected from the group consisting of:

(a) a whole immunoglobulin molecule;

(b) an scFv;

(c) a chimeric antibody;

(d) a Fab fragment;

(e) an F(ab')2; and

(f) a disulfide linked Fv.

45. The antibody or fragment thereof of claim 35 which comprises a heavy chain immunoglobulin constant domain selected from the group consisting of:

(a) a human IgM constant domain;

(b) a human IgG1 constant domain;

(c) a human IgG2 constant domain;

(d) a human IgG3 constant domain;

(e) a human IgG4 constant domain; and

(f) a human IgA constant domain.

46. The antibody or fragment thereof of claim 35 which comprises a light chain immunoglobulin constant domain selected from the group consisting of:

(a) a human Ig kappa constant domain; and

(b) a human Ig lambda constant domain.

47. The antibody or fragment thereof of claim 35 wherein the antibody or fragment thereof has a dissociation constant (K_D) of less than or equal to 10^{-9} M.

48. The antibody or fragment thereof of claim 35 wherein the antibody or fragment thereof has a K_D less than or equal to 10^{-10} M.

49. The antibody or fragment thereof of claim 35 wherein the antibody or fragment thereof has a K_D between less than or equal to 10^{-11} M.

50. The antibody or fragment thereof of claim 35 wherein the antibody or fragment thereof has a K_D between less than or equal to 10^{-12} M.

51. The antibody or fragment thereof of claim 35 wherein the antibody or fragment thereof is conjugated to a detectable label.

52. The antibody or fragment thereof of any one of claim 35 wherein the antibody or fragment thereof is attached to a solid support.

53. The antibody or fragment thereof of claim 35 wherein the antibody or fragment thereof specifically binds PA in a Western blot.

54. The antibody or fragment thereof of claim 35 wherein the antibody or fragment thereof specifically binds PA in an ELISA.

55. An isolated cell that produces the antibody or fragment thereof of claim 35.

56. A method of treatment of anthrax infection or anthrax toxin poisoning comprising administering to an animal the antibody or fragment thereof of claim 35.

57. The method of claim 56 wherein the animal is a human.

58. The method of claim 56 wherein the treatment is prophylactic.

59. The method of claim 56 wherein the antibody or fragment thereof is administered in combination with a second antibody or fragment thereof that specifically binds PA.

60. The method of claim 56 wherein the antibody or fragment thereof is administered in combination with an anti-anthrax agent.

61. The method of claim 60 wherein the anti-anthrax agent is selected from the group consisting of:

(a) a soluble form of the ATR receptor;

(b) a soluble form of the CMG2 receptor;

(c) an anti-ATR antibody;

(d) an anti-EF antibody;

(e) an anti-LF antibody;

(f) an anthrax vaccine; and

(g) a polyvalent form of the P1 peptide.

62. The method of claim 56 wherein the antibody or fragment thereof is administered in combination with an antibiotic.

63. The method of claim 62 wherein the antibiotic is ciprofloxacin hydrochloride.

64. The method of claim 62 wherein the antibiotic is doxycycline.

65. The method of claim 62 wherein the antibiotic is selected from the group consisting of:

(a) penicillin G procaine;

(b) amoxicillan;

(c) ofloxacin; and

(d) levofloxacin.

66. The method of claim 56 wherein the antibody or fragment thereof is administered in combination with a member selected from the group consisting of:

(a) a protease inhibitor;

(b) an anti-TNF-alpha antibody; and

(c) an anti-IL-1beta antibody.

67. A kit comprising the antibody or fragment thereof of claim 35 and a means for administering said antibody to an animal.

68. The kit of claim 67 wherein the animal is a human.

69. The cell line contained in ATCC Deposit Number PTA-4796.

70. The antibody produced by the cell line of claim 69.

71. An isolated human or humanized monoclonal antibody or fragment thereof that competitively inhibits the specific binding of the antibody produced by the hybridoma of ATCC Deposit Number PTA-4796 to the polypeptide of SEQ ID NO:2 or a fragment thereof.

72. The antibody or fragment thereof of claim 71 wherein said antibody or fragment thereof competitively inhibits the binding of the antibody produced by the hybridoma of ATCC Deposit Number PTA-4796 to the protein of SEQ ID NO:2 or a fragment thereof by at least 50%.

73. The antibody or fragment thereof of claim 71 wherein said antibody or fragment thereof competitively inhibits the binding of the antibody produced by the hybridoma of ATCC Deposit Number PTA-4796 to the protein of SEQ ID NO:2 or a fragment thereof by at least 75%.

74. The antibody or fragment thereof of claim 71 wherein said antibody or fragment thereof competitively inhibits the binding of the antibody produced by the hybridoma of ATCC Deposit Number PTA-4796 to the protein of SEQ ID NO:2 or a fragment thereof by at least 90%.

75. The antibody or fragment thereof of claim 71 wherein said antibody or fragment thereof competitively inhibits the binding of the antibody produced by the hybridoma of ATCC Deposit Number PTA-4796 to the protein of SEQ ID NO:2 or a fragment thereof by at least 95%.

76. A method of treatment of anthrax infection or anthrax toxin poisoning comprising administering to an animal an antibody or fragment thereof that specifically binds PA wherein said antibody or fragment thereof has a VH domain that has an amino

acid sequnce that is identical to the amino acid sequence of the VH domain of the antibody produced by the cell line contained in ATCC Deposit Number PTA-4796 and wherein said antibody has a VL domain that has an amino acid sequence that is identical to the amino acid sequence of the VL domain of the antibody produced by the cell line contained in ATCC Deposit Number PTA-4796.

77. The method of claim 76 wherein the animal is a human.

78. The method of claim 76 wherein the treatment is prophylactic.

79. The method of claim 76 wherein the antibody or fragment thereof is administered intravenously (IV).

80. The method of claim 76 wherein the antibody or fragment thereof is administered sub-cutaneously (SC).

81. The method of claim 76 wherein the antibody or fragment thereof is administered intramuscularly (IM).

82. The method of claim 76 for treating anthrax infection or anthrax toxin poisoning wherein the antibody or fragment thereof is administered in a quantity in the range of 1 to 100 milligrams per kilogram of the animal's body weight.

83. The method of claim 82 wherein the antibody or fragment thereof is administered in a quantity in the range of 1 to 10 milligrams per kilogram of the animal's body weight.

84. The method of claim 76 for preventing anthrax infection or anthrax toxin poisoning wherein the antibody or fragment thereof is administered in a quantity in the range of 0.1 to 20 milligrams per kilogram of the animal's body weight.

85. The method of claim 84 wherein the antibody or fragment thereof is administered in a quantity in the range of 1 to 10 milligrams per kilogram of the animal's body weight.

86. The method of claim 76 that prevents or reduces bacteremia associated with anthrax infection.

87. The method of claim 76 wherein the antibody or fragment thereof is administered in combination with an antibody or fragment thereof that specifically binds PA wherein said antibody or fragment thereof has a VH domain or a VL domain with an amino acid sequence that is distinct from the VH domain or the VL domain, respectively, of the antibody produced by the cell line contained in ATCC Deposit Number PTA-4796.

88. The method of claim 76 wherein the antibody or fragment thereof is administered in combination with an anti-anthrax agent.

89. The method of claim 88 wherein the anti-anthrax agent is selected from the group consisting of:

(a) a soluble form of ATR;

(b) a soluble form of the CMG2 receptor;

(c) an anti-ATR antibody;

(d) an anti-EF antibody;

(e) an anti-LF antibody;

(f) an anthrax vaccine; and

(g) a polyvalent form of the P1 peptide.

90. The method of claim 76 wherein the antibody or fragment thereof is administered in combination with an antibiotic.

91. The method of claim 90 wherein the antibiotic is ciprofloxacin hydrochloride.

92. The method of claim 90 wherein the antibiotic is doxycycline.

93. The method of claim 90 wherein the antibiotic is selected from the group consisting of:

(a) penicillin G procaine;

(b) amoxicillan;

(c) ofloxacin; and

(d) levofloxacin.

94. The method of claim 76 wherein the antibody or fragment thereof is administered in combination with a member selected from the group consisting of:

(a) a protease inhibitor;

(b) an anti-TNF-alpha antibody; and

(c) an anti-IL-1beta antibody.

95. A kit comprising an antibody or fragment thereof that has the same heavy chain and light chain as the antibody produced by the cell line contained in ATCC Deposit Number PTA-4796, and a means for administering said antibody to an animal.

96. The kit of claim 95 wherein the animal is a human.